



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,771	06/01/2001	Takaya Sato	8292.029	1304
35870	7590	09/12/2005	EXAMINER	
APEX JURIS, PLLC 13194 EDGEWATER LANE NORTHEAST SEATTLE, WA 98125			CANTELMO, GREGG	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/870,771

Applicant(s)

SATO ET AL.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the amendment received July 15, 2005:
 - a. Claims 11-14 are pending. Claims 1-10 have been cancelled as per Applicant's request.
 - b. The allowability of claim 11 has been withdrawn in light of new prior art of record, cited herein.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 11-13 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tanaka of record.

Tanaka teaches of a method of manufacturing an electrode structure comprising an electrode material, binder and solvent onto a current collecting member and directing warm breeze onto the compound mixture to gradually vaporize the solvent and form an electrode film on the current collecting member. The prior art teaches of using air at 20-

Art Unit: 1745

350 °C and preferably 40° C to 200° C. The speed of the air ranges from 0.1 to 100 m/sec and preferably 1 to 30 m/sec (col. 5, ll. 1-10). 0.1 m/sec and 1 m/sec being specific data points in the instant claimed range (as applied to claim 11). The air is controlled at preferable temperatures from 40-200° C and a preferable rate of 1-30 m/second (as applied to claim 11). The preferable range of 40-200 ° C is held to anticipate the instant claimed range of 60-150° C with sufficient specificity. The specific data points of 0.1 m/sec and 1 m/sec fall within the instant claim range as well. The lower portion of the range of Tanaka and specific data points of 0.1 m/sec and 1 m/sec are explicitly within the range of claim 11 and thus are held to be a clear teaching of this range. Thus upon further consideration, the prior art of Tanaka is held to sufficiently anticipate the ranges of claim 11. See MPEP § 2131.03.

At a temperature of 40-200° C, and an additional teaching of drying via low-moisture air (i.e. dry air) this range will inherently provide a dry air heat (col. 1, 5, ll. 2-10 as applied to claim 12).

The mixture contains an electrically conductive material (Example 1 and col. 3, line 4 through col. 4, line 9 as applied to claim 13).

Thus the claimed ranges are held to be taught by Tanaka with sufficient specificity.

In the alternative:

When a solvent remains in the depolarizing mix for the electrode, a drying step is employed using dry air at a temperature range from 20-350°C and preferably 40°C to 200°C and a wind velocity from 0.1 to 100 m/sec, preferably 1 to 30 m/sec. 0.1 m/sec

Art Unit: 1745

and 1 m/sec being specific data points which fall within the instant claimed air speed range.

The preferable range of 40-200 °C encompasses the instant claimed range.

It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

In reviewing the overall teachings of Tanaka, there is sufficient disclosure to lead one of ordinary skill in the art to employ any combination of speeds and temperatures within the range of Tanaka for the purpose of evaporating the solvent from the mixture.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Tanaka by selecting any temperature and air speed in the range of Tanaka since it would have provided sufficient means for evaporating the solvent from the electrode. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). In the case where the claimed

Art Unit: 1745

ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990). Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Tanaka discloses that the depolarizing mix for electrode is prepared using a mortar, a mixer, a homogenizer, a sand mill, a dissolver, a paint shaker, a kneader or Dynomill (col. 4, ll. 32-35). Thus Tanaka teaches of making a homogeneous mixture.

The depolarizing mix is then applied to the electrode by such was including blade coating or knife coating. Each of these are considered to be substantially the same as press sliding since the knife which provides the depolarizing mix to the electrode presses onto the electrode upon application of the depolarizing mix. Thus upon further consideration, Tanaka appears to teach of the same application process as defined in the instant claim.

Tanaka teaches of a method of manufacturing an electrode structure comprising an electrode material, binder and solvent onto a current collecting member and directing warm breeze onto the compound mixture to gradually vaporize the solvent and form an electrode film on the current collecting member. The prior art teaches of using air at 20-350 °C and preferably, 40° C to 200° C. The speed of the air ranges from 0.1 to 100 m/sec and preferably 1 to 30 m/sec (col. 5, ll. 1-10). 0.1 m/sec and 1 m/sec being

Art Unit: 1745

specific data points in the instant claimed range (as applied to claim 14). The air is controlled at preferable temperatures from 40-200° C and a preferable rate of 1-30 m/second (as applied to claim 14). The preferable range of 40-200 ° C is held to anticipate the instant claimed range of 60-150° C with sufficient specificity. The specific data points of 0.1 m/sec and 1 m/sec fall within the instant claim range as well. The lower portion of the range of Tanaka and specific data points of 0.1 m/sec and 1 m/sec are explicitly within the range of claim 1 and thus are held to be a clear teaching of this range. Thus upon further consideration, the prior art of Tanaka is held to sufficiently anticipate the ranges of claim 14. See MPEP § 2131.03.

The mixture contains an electrically conductive material (Example 1 and col. 3, line 4 through col. 4, line 9 as applied to claim 4).

Thus the claimed ranges are held to be taught by Tanaka with sufficient specificity.

In the alternative:

When a solvent remains in the depolarizing mix for the electrode, a drying step is employed using dry air at a temperature range from 20-350°C and preferably 40°C to 200°C and a wind velocity from 0.1 to 100 m/sec, preferably 1 to 30 m/sec. 0.1 m/sec and 1 m/sec being specific data points which fall within the instant claimed air speed range.

The preferable range of 40-200 °C encompasses the instant claimed range.

It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is

Art Unit: 1745

properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

In reviewing the overall teachings of Tanaka, there is sufficient disclosure to lead one of ordinary skill in the art to employ any combination of speeds and temperatures within the range of Tanaka for the purpose of evaporating the solvent from the mixture.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Tanaka by selecting any temperature and air speed in the range of Tanaka since it would have provided sufficient means for evaporating the solvent from the electrode. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990). Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272,

Art Unit: 1745

205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Response to Arguments

3. Applicant's arguments with respect to claim 11-13 have been considered but are not persuasive in light of the new grounds of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art of the instant application in view of U.S. patent No. 6,127,065 (Yamamoto) and Tanaka, of record.

A typical electrode structure of the prior art is manufactured by coating a current-collecting member surface with a compound mixture containing an electrode material, a powdered electrically-conducting substance, binder and solvent, vaporizing the solvent by directing hot air flow, and drying the coating to attach an electrode film to the surface of the current-collecting member. Unfortunately, the electrode film is prone to peel away from the current-collecting member and as a consequence the electrical resistance of the electrode film does not decrease. Here, hot air flow is generated by a hot air heater utilizing outside air of 80-200.degree. C. at 15-25 m/second. For example as shown in FIG. 11, the hot air heater is configured such that electrode

Art Unit: 1745

structures containing an electrode film h coated on a current-collecting member g is moved by the conveyor d into the cabinet c and hot air flow f is directed onto the electrode film h from a hot air outlet to vaporize the solvent involved. The hot air flow moves the solvent outwards by way of the cabinet outlet e (paragraph [0002] as applied to claim 14).

The differences between the admitted prior art of record disclosed in paragraph [0002] and the instant claims are of the compound mixture comprising active carbon material, and the electrically conducting material being carbon black and of the air flow rate for evaporating the solvent.

With respect to the active material and electrically conducting substance:

The mixture of the admitted prior art employs both an active material and electrically conducting substance, but does not specify these materials to the extent specified in claim 14.

The use of carbon active materials in negative electrodes is well known in the art as shown by Yamamoto (col. 4, ll. 27-41).

The motivation for using carbon as the active material in a negative electrode in a lithium battery is that carbon materials are capable of lithium ion insertion/separation and yield a longer battery cycle life span.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of the admitted prior art of the instant application by selecting the electrode material to be a carbon material since it would have provided a material capable of intercalating lithium ions and improve the

Art Unit: 1745

battery life cycle span. Carbonaceous negative electrode materials are well within the skill of the ordinary worker in the art as an active electrode material. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to the electrically-conducting material being carbon black:

Tanaka discloses providing a depolarizing mix to electrodes in a lithium battery as discussed above. The conductive agents used in the electrodes include carbon black (paragraph bridging columns 3 and 4).

The motivation for using carbon black is that it provides a material having excellent conductivity in the mix.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of the admitted prior art of the instant application by specifying the conductive material to be carbon black since it would have provided a material to the mix having excellent conductivity. Carbon black is well within the skill of the ordinary worker in the art as a conductive filler for electrode and electrode mixes. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to the warm breeze:

Art Unit: 1745

The admitted prior art in the instant application, at paragraph 2, discloses that hot air flow is generated by a hot air heater utilizing outside air of 80-200.degree. C. at 15-25 m/second. For example as shown in FIG. 11, the hot air heater is configured such that electrode structures containing an electrode film h coated on a current-collecting member g is moved by the conveyor d into the cabinet c and hot air flow f is directed onto the electrode film h from a hot air outlet to vaporize the solvent involved. The hot air flow moves the solvent outwards by way of the cabinet outlet e (paragraph [0002] as applied to claim 14).

Tanaka discloses of using air at 20-350 °C and preferably 40° C to 200° C. The speed of the air ranges from 0.1 to 100 m/sec and preferably 1 to 30 m/sec (col. 5, ll. 1-10). 0.1 m/sec and 1 m/sec being specific data points in the instant claimed range (as applied to claim 14). The air is controlled at preferable temperatures from 40-200° C and a preferable rate of 1-30 m/second (as applied to claim 14). The preferable range of 40-200 ° C is held to anticipate the instant claimed range of 60-150° C with sufficient specificity. The specific data points of 0.1 m/sec and 1 m/sec fall within the instant claim range as well. The lower portion of the range of Tanaka and specific data points of 0.1 m/sec and 1 m/sec are explicitly within the range of claim 14 and thus are held to be a clear teaching of this range. Thus upon further consideration, the prior art of Tanaka is held to sufficiently anticipate the ranges of claim 14. See MPEP § 2131.03.

Tanaka recognized evaporating the solvent at the same temperature range as the admitted prior art in paragraph 2 of the instant application, and furthermore that such evaporation techniques can be achieved at air speeds as low as 0.1 m/sec.

Art Unit: 1745

When a solvent remains in the depolarizing mix for the electrode, a drying step is employed using dry air at a temperature range from 20-350°C and preferably 40°C to 200°C and a wind velocity from 0.1 to 100 m/sec, preferably 1 to 30 m/sec. 0.1 m/sec and 1 m/sec being specific data points which fall within the instant claimed air speed range.

The preferable range of 40-200 °C encompasses the instant claimed range.

It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

In reviewing the overall teachings of Tanaka, there is sufficient disclosure to lead one of ordinary skill in the art to employ any combination of speeds and temperatures within the range of Tanaka for the purpose of evaporating the solvent from the mixture.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of the admitted prior art of the instant application by selecting any temperature and air speed in the range of Tanaka since it would have provided sufficient means for evaporating the solvent from the electrode. It has been held that when the difference between a claimed invention and

Art Unit: 1745

the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990). Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPAT 5945159 discloses shear-mixing a polymer to coat finely divided particles (abstract, col. 1, ll.11 and 40-50 and col. 2, ll. 56-65).

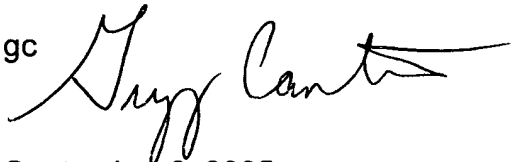
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo
Primary Examiner
Art Unit 1745

gc

A handwritten signature in black ink, appearing to read "Gregg Cantelmo", with a stylized flourish at the end.

September 6, 2005